

CLAIMS

1. An automatic lathe which has a tool post and a spindle configured to relatively move in a spindle axis line direction and which machines a material gripped by a chuck at the tip of the spindle by use of a tool installed on the tool post, the automatic lathe, characterized by comprising:

5 a head stock configured to move forward and backward;

the spindle rotatably supported on the head stock and having a through-hole which allows the rod-like material to be inserted therethrough;

10 the tool post equipped with the tool to machine the material gripped by the chuck of the spindle;

15 a guide bush support table disposed closer to a tip side of the spindle than the head stock;

20 support table fixing means for positioning and fixing the guide bush support table at a specified position on a bed;

25 a guide member which is rotatably supported on the guide bush support table and which is regulated so as not to move forward and backward with respect to the guide bush support table and in which a through-hole is formed so that the spindle is inserted therein;

30 a guide bush detachably fitted to the tip of the guide member;

driving means provided in the guide bush support table to rotate the guide member together with the guide bush;

rotation transmission means for transmitting the rotation of the guide member to the spindle;

5 spindle moving means for moving the spindle forward and backward together with the head stock inside the guide member; and

10 spindle fixing means for preventing the spindle from moving forward and backward with respect to the guide bush support table, and positioning and fixing the spindle at a specified position on the guide bush support table when the guide bush is removed from the guide member.

2. The automatic lathe according to claim 1, characterized in that a guide is provided to guide the forward and backward movement of the guide bush support table so that the guide bush support table is movable along the guide when the fixing of the guide bush support table by the support table fixing means is cancelled, and that when the guide bush is removed to machine the material without using the guide bush, the material gripped by the 20 chuck of the spindle is machined while the head stock and the guide bush support table are being integrally moved forward and backward.

3. The automatic lathe according to claim 1 or 2, 25 characterized in that the support table fixing means has a positioning member positioned and fixed on the bed, and a bolt coupling the positioning member to the guide bush support table.

30 4. The automatic lathe according to claim 3,

characterized in that a spacer with a specified width is placed between the positioning member and the guide bush support table so that the position of the guide bush or the tip of the spindle is adjustable when the guide bush is fitted or removed.

5 5. The automatic lathe according to claim 3 or 4, characterized in that the positioning member is a tool post base which supports the tool post.

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6. The automatic lathe according to any one of claims 1 to 5, characterized in that the rotation transmission means is an engaging member which engages with the spindle on the tip and terminal end sides of the guide member.

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7. The automatic lathe according to any one of claims 1 to 6, characterized in that the rotation transmission means and the spindle fixing means have an attachment fitted and fixed to the guide member and the tip of the spindle after the guide bush is removed from the tip of the guide member, an engaging portion formed in an inner peripheral surface of the attachment, and an engaged portion formed in the spindle to be engaged with the engaging portion.

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8. The automatic lathe according to any one of claims 1 to 7, characterized in that the head stock is coupled to the guide bush support table by coupling means when the guide bush is removed from the guide member.

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9. The automatic lathe according to claim 8,
characterized in that a thermal expansion absorption member
which absorbs a dimensional change of the spindle due to
5 thermal expansion is provided in at least one place of the
spindle.

10. The automatic lathe according to claim 9,
characterized in that the thermal expansion absorption
member comprises regulating means for regulating the
spindle so that the spindle does not move forward and
backward with respect to the head stock when the guide bush
is fitted, and regulation canceling means for canceling the
regulation of the spindle by the regulating means when the
15 guide bush is removed.

11. The automatic lathe according to claim 10,
characterized in that the regulating means comprises an
engaging member which engages with the spindle in the front
20 and rear on the spindle axis line, and a fitting member
which fits the engaging member to the head stock so that
the engaging member does not rotate with respect to the
head stock and so that the engaging member has a gap of
preset dimensions in the spindle axis line direction
25 without separating from the head stock when the regulation
of the spindle is cancelled by the regulation canceling
means, and

30 the regulation canceling means is a fitting member
which fits and fixes the engaging member onto the head
stock.